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Interference Effects 403PREREQUISITE  
CONCEPTS AND SKILLS

- Physical properties of waves
- Reflection and refraction of waves
- Superposition of waves
- Using a ripple tank



**P**eering through a telescope, you can see the “Red Planet,” Mars, and, off in the distance, Jupiter’s stripes. Earth looks like a blue marble and the gas giant Neptune appears to be crystal blue. This composite photograph reveals a richness of knowledge transmitted in the form of light that reaches Earth from the expanse of space.

What are the properties of light that allow it to travel millions of kilometres through deep space from the Sun, to the other planets, and back to our telescope, carrying information in the form of colour and intensity. Careful visual observation of solar system objects yields a great deal of knowledge.

Galileo used a telescope that today would be considered primitive to discover four of Jupiter’s moons. His discovery solidified in his mind that Copernicus’ concept of a Sun-centred solar system was correct, even though such a concept clashed with the scientific and religious theories of his time.

Less than 50 years later, a new debate raged, not about the solar system, but about the very nature of light, which streams from the Sun, illuminates Earth, and seems to light up a room instantly. The new debate struggled to compare light to something more common to everyday experience, attempting to classify this elusive form of energy as either a wave or a particle.

In this chapter, you will learn about the attempts to formulate and verify a model for light. You will discover that the techniques that established the wave model for light also led to some practical applications and research tools.